Instructions: Complete each of the following as practice.
Note: Some of these questions make more sense once I review complex numbers...

1. Compute the characteristic polynomial of the arbitrary 2×2 matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$.
2. Suppose M is a diagonal matrix. What are the eignevalues of M?
3. Suppose M is an upper- (or lower-) triangular matrix. What are the eigenvalues of M?
4. Suppose M is a matrix with all eigenvalues are 0. Is M necessarily the zero matrix?[1]
5. For further exercises, see the following (note: this list may break with future versions of these textbooks).
   (a) Beezer NONE
   (b) Hefferon page 421 (problems 3.23 – 3.48); ignore instructions to compute eigenvectors for the time being.
   (c) Matthews NONE

[1] **Hint**: What does this condition say about the linear operator $M - \lambda I$?